

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2004/001276

International filing date (day/month/year)
24.03.2004

Priority date (day/month/year)
25.03.2003

International Patent Classification (IPC) or both national classification and IPC
G06F3/00

Applicant
BRITISH TELECOMMUNICATIONS PUBLIC LIMITED COMPANY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b/s(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/001276

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/001276

Box No. II Priority

1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
- ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-33,38,41,42
	No: Claims	1,34,35,36,37,39,40
Inventive step (IS)	Yes: Claims	-
	No: Claims	1-42
Industrial applicability (IA)	Yes: Claims	1-42
	No: Claims	-

2. Citations and explanations

see separate sheet

Re Item V.

1. The following documents are referred to in this communication:

- D1: EP-A-1 255 203 (SONY COMP ENTERTAINMENT AMERIC) 6 November 2002 (2002-11-06)
D2: SATO J ET AL: "Autonomous behavior control of virtual actors based on the AIR model" COMPUTER ANIMATION '97 GENEVA, SWITZERLAND 5-6 JUNE 1997, LOS ALAMITOS, CA, USA, IEEE COPUT. SOC. P, US, 5 June 1997 (1997-06-05), pages 113-118, XP010227328 ISBN: 0-8186-7984-0
D3: US-B1-6 212 502 (BALL ET AL) 3 April 2001 (2001-04-03)*

* refers to a document cited as evidence of the skilled person's general knowledge.

2. The application does not meet the requirements of Article 6 PCT, because claims 1, 14, 15, 24, 34, 35, 36, 37, 39 and 40 are not clear.
- 2.1 Although independent device claims 1 and 40 and independent method claims 35, 36 and 37 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT. The relevant subject-matter would more appropriately be defined in terms of a single independent claim per category, followed by dependent claims covering features which are merely optional.
- 2.2 Claims 14, 15, 24, 35 and 36 refer to "generating behaviour by the object". This expression is unclear as it could mean that the behaviour is generated by the object, i.e. the rules for selecting an action to be performed are generated by the object, or that the behaviour is generated by other means and then performed by the object. From page 18, line 22 - page 19, line 6, for example, it is clear that the behaviour of the object is generated by the behavioural controller.

- 2.3 The phrase in claim 35 "wherein perceived behaviour in the virtual environment is generated behaviour for an object under the control of a behaviour controller" is unclear. It is unclear whether this statement is intended to define that "generated behaviour" is generated dependent upon the "perceived behaviour" or vice versa or whether the terms "perceived behaviour" and "generated behaviour" are intended to refer to the same behaviour. Moreover, the term "perceived behaviour" lacks definition. It is unclear who is "perceiving" the behaviour, and how this "perceived behaviour" relates to either one of the "behaviour conforming to one demographic group" and the "behaviour conforming to another demographic group" mentioned earlier in claim 35 (lines 10-12, page 64). It appears from the description, page 7, lines 1-11 and line 29, that this statement is intended to mean that behaviour is generated under the control of a behavioural controller and performed by an object in a virtual environment.
- 2.4 Claim 35 is unclear when it refers to "translating input which generates a behavioural action according to a first demographic group into equivalent behaviour associated with the other demographic group". It would appear that the previous steps defined in claim 35 (lines 15-20, page 64) are those necessary for this translation. However, the step in lines 21-23, page 64, is presented as an additional step. It is unclear whether the steps defined in lines 15-20 do indeed carry out the translation, in which case the "additional step" of lines 21-23 is a repetition of the same method, or whether these steps do not in fact belong to the method of translating the behaviour to which the claim is directed. Thus claim 35 is rendered unclear. In the light of the description, page 3, lines 16-23, it seems that the steps defined in claim 35 lines 15-20 do carry out the translation and that the final phrase on lines 21-23 is redundant and should be removed.
- 2.5 Independent claims 34 and 39 do not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

Claim 34 refers to a device "arranged" to have a suite of computer programs stored thereon, which would cause the device to function as the translator defined in claims 1 to 33. Therefore the computer programs which cause the device to function as the translator defined in claims 1 to 33 are not actually stored on the device, but the device is purely a generic one suitable for having the computer

programs stored upon it. Therefore, the device of claim 34 does not have any of the essential features of the invention as defined in claims 1, 35, 36, 37 or 40.

A similar problem occurs in claim 39. Claim 39 defines a suite of programs "forming a set of instructions which when executed are arranged to cause one or more computer systems to perform one of the methods of claims 35 to 37". This would include a program for launching any generic application or for inputting a behavioural action to an avatar of claims 35 to 37 but does not contain any of the essential features of the invention as defined in claims 1, 35, 36, 37 or 40.

Claims 34 and 39 must include all the essential technical features of the invention in order to satisfy the requirements of Article 6 PCT.

3. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent device claims 1 and 40 and independent method claims 35 and 37 is not new in the sense of Article 33(2) PCT.

3.1 Regarding claim 1, document D1 discloses:

a behavioural translator arranged for use by a behavioural controller of an object (column 1, lines 43-58), the translator arranged to map information representing behaviour conforming to a first demographic group to behaviour conforming to a second demographic group (column 6, lines 4-6), the behavioural translator comprising:

means to receive input (column 6, lines 15-21)

means to process said input to associate the received input with behaviour by the object conforming to the first demographic group, and

means to map the behaviour derived from the received input to output generating behaviour conforming to the second demographic group (column 6, line 50 - column 7, line 12).

Whilst D1 does not explicitly discuss the "means to associate the received input with behaviour by the object conforming to a first demographic group", it is implicit that such means are present. Means for recognising the language as English are necessary for language translation from English to French (see column 7, lines 9-12). An example of such means would be to allow user input to identify English as the source language.

Therefore, the subject-matter of claim 1 is not new in the light of D1.

3.2 Independent claim 40 defines a behavioural translation device for mapping information representing behaviour conforming to a first culture to behaviour conforming to a second culture. D1 (see particularly column 7, lines 9-12) discloses a translation device for mapping language or dialect of a first culture (English) to language or dialect of a second culture (French). Therefore, the subject-matter of claim 40 is not new in the light of D1.

3.3 Regarding claims 35 and 37, document D1 discloses:

a method of translating behaviour in a virtual environment from behaviour conforming to one demographic group to behaviour conforming to another demographic group (column 6, lines 4-6), the method comprising the steps of:
receiving input associated with one or more behavioural actions (column 6, lines 15-21);
inferring a plurality of behavioural parameter values from said input in accordance with a behavioural framework i.e. recognising speech waveforms as known waveforms of a speech framework of the given language and so converting the captured speech to text data which may be translated by translation software (column 6, lines 47-53);
generating equivalent behaviour by the object using the output derived from the parameter values (column 6, lines 53-58; column 7, lines 9-14).

Hence, in view of their present wording, the subject-matter of claims 35 and 37 is not new with respect to D1. Preventively, even if the features of claims 35 and 37 were further specified to define the behaviour as being another behavioural action other than speech (see eg. claim 9 and description, page 5, lines 27-29), their subject-matter would not be inventive. D1 teaches an application for controlling a character to be displayed (column 8, lines 57-58) using a character profile to tailor the voice with which the character speaks in bi-directional applications such as networked video games etc. (column 7, lines 31-41; column 8, lines 21-52). The language may be translated or the expression or dialect of the voice converted to one determined according to parameters of a profile. It would be clear to a person skilled in the art that the language or voice is only one of many behavioural characteristics which should be customised for display to individual recipients. The choice of which behavioural characteristics of a displayed character should be customised is purely a business decision for the provider of the networked game.

3.4 Independent claim 36 is also not new in the light of D1. In addition to the concept of independent claims 35 and 37 of determining behavioural parameter values from some input and using these to generate some "equivalent behaviour", independent claim 36 introduces the concept of a framework of rules or "nodes" used in mapping some "input" to the output behaviour. D1 must necessarily use a framework of rules and mappings for combining input text and input character profile parameters to produce a translated text to be output. Hence the additional features of claim 36 are implicitly disclosed and claim 36 is also not novel in the light of D1.

4. Furthermore, the subject-matter of independent claims 1, 35, 36, 37 and 40 is not inventive in the light of document D2 (Article 33(3) PCT).

Document D2 discloses:

a method of generating behaviour in an object under control of a behavioural controller (page 113, abstract) comprising a framework of nodes (see eg. page 113, figure 1) the method comprising steps of:

at least one node receiving input associated with a behavioural action (see page 113, left column, lines 31-33, which refers to an external stimulus input to a virtual actor, and page 114, left column, section 3. point 1. which gives the example of the behaviour of another actor as an external stimulus);
the node which receives input mapping received input to output (application of "emotion rules", see figure 1 and page 114, section 3.2);
inferring a plurality of behavioural parameter values for other nodes in the framework using said output (page 113, right column, lines 13-15: "The values of the parameters are mutually adjusted based on the emotion rule as a result of communication between actors");
mapping the received input using said inferred behavioural parameter values to provide output by the behavioural controller which generates equivalent behaviour by the object (see eg. page 114, section 3. points 4., 5. and 6.; page 115, table 2. and page 116, section 4 which discusses the author's choice of the motions "walk" as a moving action, "shake hands" as a FRIENDLY action and "hit" as an ANTIPATHY action).

The subject-matter of claims 1, 35, 36, 37 and 40 differs from the teaching of D2 in that the arrangement of D2 does not aim to translate behaviour conforming to one demographic group to behaviour conforming to another demographic group. D2, however, teaches generating **appropriate** behaviour for a virtual avatar dependent upon input behaviour. The arrangement of D2 selects the appropriate behaviour using the same technical method and the same technical system, as described in this application (as specified above).

It is clear that the motions to depict the different behaviours will be chosen as appropriate to the intended viewer's demographic group. In a realistic situation, the technical professional would receive information of the culture-specific gestures which should be incorporated for each specific demographic group (i.e. for a Japanese market) as part of the task information given to him by a non-technical superior. He would be required to insert this information into eg. table 2. (D2, page 115). A technical person would routinely implement into the arrangement of D2 the necessary technical means for user customisation, thereby arriving at the subject-matter of claims 1, 35, 36, 37 and 40. The subject-matter of claims 1, 35, 36, 37 and 40 is therefore obvious.

5. Independent claims 34 and 39 do not define the essential features of the invention as discussed in section 2.5 above. However, even if claims 34 and 39 were to define devices according to claims 1 or 40 executing computer programs performing the method of claims 35-37, the subject-matter would not be inventive as claims 1, 35-37 and 40 do not involve subject-matter which is novel or inventive.
6. Dependent claims 2-33, 38, 41 and 42 do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of Article 33(3) PCT with respect to inventive step.
 - 6.1 Claim 2 constitutes a list of sociological groupings of demographic groups and so adds no technical subject-matter which could contribute to an inventive step. Similarly, the additional features of claims 9, 10, 11, 17 and 18, relate purely to possible behavioural actions and aesthetic appearances which do not influence the technical subject-matter of the invention, but would be the domain of artistic/psychological experts involved in the implementation of the system.

- 6.2 The additional features of claims 3 and 4 relate to the application of the translator to virtual objects as is known from D1 (see eg. column 8, lines 53-58) and their use in an obvious list of various known virtual environments.
- 6.3 The additional features of claim 5 relate to the use of an avatar in a networked system whereby two participants belong to different demographic groups as known from D1 (column 6, lines 1-6; column 6, lines 29-32).
- 6.4 The additional feature of claim 6 relates to both participants viewing the avatar simultaneously as would be the case in the networked game system of D1 (column 8, lines 21-52). The internet chat or internet telephony embodiments of D1 (column 10, lines 40-46) would also involve real-time interaction.
- 6.5 The additional features of claims 7, 8, 12, 13, 14, 15, 16, 23, 30, 31, 41 and 42 relate to the use of the behavioural controller and behavioural translator in a set-up such as that of D1 in which translation software and behaviour controlling software are used to implement the system discussed in sections 3.1 and 3.2 above.
- 6.6 The reference in claim 19 to a behavioural framework with an "internally flexible structure" seems to refer to the behavioural framework utilising eg. Bayesian or neural networks (see description page 44, line 19 - page 45, line 24). The application of Bayesian or neural networks to such a behavioural framework for generating and analysing behaviour of a character is well known in the art (see eg. D3, column 4, line 55 - column 5, line 48). A similar argument applies to claim 21.
- 6.7 The additional feature of claims 20, 27 and 28 relates to the behavioural framework comprising a hierarchy of behavioural nodes, mapping between the nodes and input to the framework. The implementation of such a framework in behaviour generation for virtual characters is known eg. from D3, column 5, lines 5-21.
- 6.8 The additional feature of claim 22 is that parameter values are determined by a combination of behavioural action inputs. This is known from D2 (see D2, section 3.2).

- 6.9 Claim 24 defines a behavioural translator comprising means substantially to carry out the method of claim 35. The subject-matter of claim 24 is not new in the light of D1 for the reasons given in section 4.1 above.
- 6.10 The additional feature of claim 25 relates to the animation of the object by an animation system. This is also known from eg. D2 (page 114, section 3, points 4. and 5.).
- 6.11 The additional features of claims 26 and 32 relate to inputting a parameter value from an external source eg. a user. This is known from D1 (column 7, lines 28-30) and from D2 (page 118, left column, lines 1-3). It would be obvious to the skilled person that the input could also be made by a software agent - or indeed by an interacting avatar (see D2, section 3.2). Therefore the subject-matter of claim 33 is also not inventive.
- 6.12 The additional feature of claim 29 relates to operating upon behavioural parameter values set by predetermined functions as known from D2 (see section 3.2, particularly page 115, left column).
- 6.13 The additional feature of claim 38 is known from eg. D2 (column 114, left column, first paragraph and section 3.2, page 115).